

IFW

Attorney Docket No. IMMR-106/01US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of Louis B. ROSENBERG *et al.*

Serial No.: 10/615,927

Examiner: Unassigned

Filed: July 10, 2003

Art Unit: 2675

Confirmation No. 9912

For: **NETWORKED APPLICATIONS INCLUDING HAPTIC FEEDBACK**

U.S. Patent and Trademark Office  
220 20<sup>th</sup> Street S.  
Customer Window, Mail Stop Amendment  
Crystal Plaza Two, Lobby, Room 1B03  
Arlington, VA 22202

**INFORMATION DISCLOSURE STATEMENT TRANSMITTAL**

Enclosed is an Information Disclosure Statement and accompanying Form PTO/SB/08A for the above-identified patent application.

- ☒ In accordance with 37 C.F.R. §1.97(b), no additional fee for submission of the IDS is required.
- ☐ In accordance with 37 C.F.R. §1.97(c), also enclosed is:
  - ☐ the fee of \$180.00 as set forth in 37 C.F.R. §1.17(p); or
  - ☐ a statement as specified in 37 C.F.R. §1.97(e).
- ☐ In accordance with 37 C.F.R. §1.97(d), a statement as specified in 37 C.F.R. §1.97(e) and the fee of \$180.00 as set forth in 37 C.F.R. §1.17(p) are also enclosed.
- ☐ Check No. \_\_\_ in the amount of \$\_\_\_ for the total fee is attached.
- ☐ A return receipt postcard is also enclosed.
- ☐ Please charge \$\_\_\_ to Deposit Account No. 50-1283 for the total fee. This paper is being submitted in duplicate.

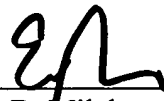
The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 50-1283.

Dated: October 18, 2004

Cooley Godward LLP  
ATTN: Patent Group  
One Freedom Square  
Reston Town Center  
11951 Freedom Drive  
Reston, VA 20190-5656  
Tel: (703) 456-8000  
Fax: (703) 456-8100

Respectfully submitted,  
**COOLEY GODWARD LLP**

By:

  
\_\_\_\_\_  
Erik B. Milch  
Reg. No. 42,887



Attorney Docket No. IMMR-106/01US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of Louis B. ROSENBERG *et al.*

Serial No.: 10/615,927

Examiner: Unassigned

Filed: July 10, 2003

Art Unit: 2675

Confirmation No. 9912

For: **NETWORKED APPLICATIONS INCLUDING HAPTIC FEEDBACK**

U.S. Patent and Trademark Office  
220 20<sup>th</sup> Street S.  
Customer Window, Mail Stop Amendment  
Crystal Plaza Two, Lobby, Room 1B03  
Arlington, VA 22202

**INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §1.97(b)**

In accordance with the duty of disclosure set forth in 37 C.F.R. §1.56,  
Applicant(s) hereby submits the following information in conformance with 37 C.F.R.  
§§1.97 and 1.98.

- ☒ Pursuant to 37 C.F.R. §1.98, a copy of each document cited in the attached Form PTO/SB/08A (1 of 2) is provided on the enclosed CD.
- ☒ No copies of the publications listed on the attached Form PTO/SB/08A (2 of 2) are being provided pursuant to 37 C.F.R. §1.98(d) because the publications were previously cited by or submitted to the Office in prior Application Serial Nos. 09/153,781, filed September 16, 1998, 08/571,606 (now U.S. Patent No. 6,219,032 B1), 09/050,665 (now U.S. Patent No. 6,219,033 B1), 08/664,086 (now U.S. Patent No. 6,028,593), 08/691,852 (now U.S. Patent No. 5,956,484) and/or 08/566,282 (now U.S. Patent No. 5,734,373) to which the above-identified application claims priority under 35 U.S.C. §120.
- ☐ No copies of any U.S. patents or U.S. patent application publications listed on the attached Form PTO/SB/08A are being provided pursuant to 37 C.F.R. §1.98 because this application was filed after June 30, 2003.
- ☐ Publication(s) \_\_\_ listed on the attached Form PTO/SB/08A were cited in a foreign search or examination report corresponding to \_\_\_ application serial no. \_\_\_ and mailed on \_\_\_.
- ☐ Enclosed is a copy of a non-English publication(s) \_\_\_. Pursuant to §609 of the M.P.E.P., Applicant submits the attached foreign search or examination report, which cites such non-English language publication(s).

- ☐ Enclosed is a copy of a non-English publication(s) \_\_\_\_\_. English language publication \_\_\_\_ (copy enclosed) claims priority from this non-English publication.
- ☐ Enclosed is an explanation of non-English publication(s) \_\_\_\_ for which an English translation is not available.
- ☐ Enclosed is an English translation of non-English publication(s) \_\_\_\_ cited in the attached Form PTO/SB/08A.
- ☐ Enclosed is a copy of pending patent Application Serial No. \_\_\_\_\_.

This Information Disclosure Statement is filed within any one of the following time periods:

- ☐ within three months from the filing date of this national application other than a CPA under 37 C.F.R. § 1.53(d);
- ☐ within three months from the date of entry of the national stage as set forth in 37 C.F.R. § 1.491 in this international application;
- ☒ before the mailing date of a first office action on the merits; or
- ☐ before the mailing of a first office action after the filing of a request for continued examination under 37 C.F.R. § 1.114.


It is respectfully requested that the Examiner consider the above-noted information and return an initialed copy of the attached Form PTO/SB/08A to the undersigned.

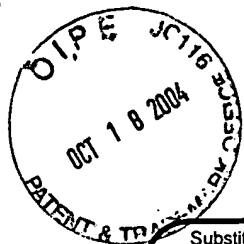
Dated: October 18, 2004

Cooley Godward LLP  
One Freedom Square  
Reston Town Center  
11951 Freedom Drive  
Reston, Virginia 20190-5656  
(703) 456-8000  
(703) 456-8100

Respectfully submitted,  
COOLEY GODWARD LLP

By:

  
\_\_\_\_\_  
Erik B. Milch  
Reg. No. 42,887



(1 of 2)

PTO/SB/08A (10-01)

Approved for use through 10/31/2002. OMB 0651-0031  
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet 1 of 6

**Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**U.S. PATENT DOCUMENTS**

Examiner	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number Kind Code <sup>2</sup> (if known)			
		6,422,941	7/23/2002	Thormer et al.	
		6,349,301	2/19/2002	Mitchell et al.	
		6,160,489	12/12/2000	Perry et al.	
		6,111,577	8/29/2000	Zilles et al.	
		5,785,630	7/28/1998	Bobick et al.	
		5,766,016	6/16/1998	Sinclair	
		5,690,582	11/25/1997	Ulrich et al.	
		5,575,761	11/19/1996	Hajianpour	
		5,547,382	8/20/1996	Yamasaki	
		5,466,213	11/14/1995	Hogan	
		5,437,607	8/1/1995	Taylor	
		5,436,622	7/25/1995	Gutman et al.	
		5,334,027	8/2/1994	Wherlock	
		5,309,140	5/3/1994	Everett	
		5,299,810	4/5/1994	Pierce	
		5,283,970	2/8/1994	Aigner	
		5,275,174	1/4/1994	Cook	
		5,271,290	12/21/1993	Fischer	
		5,240,417	8/31/1993	Smithson et al.	
		5,212,473	5/18/1993	Louis	
		5,186,695	2/16/1993	Mangseth et al.	
		5,175,459	12/29/1992	Danial et al.	
		5,165,897	11/24/1992	Johnson	
		5,078,152	1/7/1992	Bond	
		5,038,089	8/6/1991	Szakaly	
		5,035,242	7/30/1991	Franklin	
		5,022,407	6/11/1991	Horch et al.	
		5,022,384	6/11/1991	Freels	
		5,019,761	5/28/1991	Kraft	
		4,934,694	6/19/1990	McIntosh	
		4,930,770	6/5/1990	Baker	
		4,891,764	1/2/1990	McIntosh	
		4,885,565	12/5/1989	Embach	
		4,794,392	12/27/1988	Selinko	
		4,713,007	12/15/1987	Alban	

Examiner  
SignatureDate  
Considered

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Kind Codes of U.S. Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **2** of **6****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**U.S. PATENT DOCUMENTS**

Examiner	Cite No. <sup>1</sup>	Document Number Number Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		4,708,656	11/24/1987	De Vries et al.	
		4,599,070	7/8/1986	Hladky et al.	
		4,581,491	4/8/1986	Boothroyd	
		4,513,235	4/23/1985	Acklam et al.	
		4,484,191	11/20/1984	Vavra	
		4,464,117	8/7/1984	Foerst	
		4,333,070	6/1/1982	Barnes	
		4,262,549	4/21/1981	Schwellenbach	
		4,236,325	10/2/1980	Hall et al.	
		4,160,508	7/10/1979	Salsbury	
		4,127,752	11/28/1978	Lowthorp	
		3,911,416	10/7/1995	Feder	
		3,903,614	9/9/1975	Diamond et al	
		3,902,687	6/25/1973	Hightower	
		3,623,064	11/23/1970	Kagan	
		3,517,446	6/30/1970	Corlyon et al.	
		3,497,668	2/24/1970	Hirsch	
		3,220,121	11/30/1965	Cutler	
		3,157,853	11/17/1964	Hirsch	
		2,972,140	2/14/1961	Hirsch	

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			
		EP	0349086		1/3/1990	Stork Kwant B.V.	
		JP	H2-185278		7/19/1990	Taito Corporation	
		JP	H4-8381		1/13/1992	Epoch Co. and Key- Planning Co.	
		JP	H7-24147		1/27/1995	Sega Corporation	
		JP	H5-192449		8/3/1993	Taito Corporation	

Examiner  
SignatureDate  
Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Kind Codes of U.S. Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **3** of **6****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		BAIGRIE, "Electric Control Loading - A Low Cost, High Performance Alternative," <i>Proceedings of Interservice/Industry Training Systems Conference</i> , pp. 247-254, November 6-8, 1990.
		IWATA, "Pen-based Haptic Virtual Environment," 0-7803-1363-1/93 IEEE, pp 287-292, 1993.
		RUSO, "The Design and Implementation of a Three Degree of Freedom Force Output Joystick," MIT Libraries Archives, pp. 1-131, May 1990, archived 08/14/1990.
		BROOKS et al., "Hand Controllers for Teleoperation - A State-of-the-Art Technology Survey and Evaluation," JPL Publication 85-11; NASA-CR-175890; N85-28559, pp. 1-84, 03/1/1985.
		JONES et al., "A perceptual analysis of stiffness," ISSN 0014-4819 Springer International (Springer-Verlag); <i>Experimental Brain Research</i> , Vol. 79, No. 1, pp. 150-156, 1990.
		BURDEA et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and its Application to Robotic Teleoperation," 1993 IEEE International Conference on Robotics and Automation, pp. 25-44, 05/02/1993.
		SNOW et al., "Model-X Force-Reflecting-Hand-Controller," NT Control No. NPO-17851; JPL Case No. 7348, pp. 1-4, with 45 pages of attachments, 06/15/1989.
		OUH-YOUNG, "Force Display in Molecular Docking," Doctoral Dissertation, University of North Carolina at Chapel Hill, UMI Order No. 9034744, pp. 1-369, 1990.
		TADROS, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators," MIT Archive, pp. 1-88, February 1990, archived 8/13/90.
		CALDWELL et al., "Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993.
		ADELSTEIN, "Design and Implementation of a Force Reflecting Manipulandum for Manual Control research," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 1-12, 1992.
		GOTOW et al., "Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337.
		STANLEY et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 55-61, ASME 1992.
		RUSO, "Controlling Dissipative Magnetic Particle Brakes in Force Reflective Devices," DSC-Vol. 42, <i>Advances in Robotics</i> , pp. 63-70, ASME 1992.

Examiner  
SignatureDate  
Considered

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **4** of **6****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		KONTARINIS et al., "Display of High-Frequency Tactile Information to Teleoperators," <i>Telemanipulator Technology and Space Telerobotics</i> , Won S. Kim, Editor, Proc. SPIE Vol. 2057, pp. 40-50, Sep. 7-9, 1993.
		PATRICK et al., "Design and Testing of A Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," <i>Cooperative Intelligent Robotics in Space</i> , Rui J. deFigueiredo et al., Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990.
		ADELSTEIN, "A Virtual Environment System For The Study of Human Arm Tremor," <i>Ph.D. Dissertation</i> , Dept. of Mechanical Engineering, MIT, June 1989, archived 3/13/90.
		BEJCZY, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," <i>Science</i> , Vol. 208, No. 4450, pp. 1327-1335, 1980.
		BEJCZY et al., "Generalization of Bilateral Force-Reflecting Control of Manipulators," <i>Proceedings Of Fourth CISM-IFTOMM</i> , Sep. 8-12, 1981.
		MCAFFEE, "Teleoperator Subsystem/Telerobot Demonstration: Force Reflecting Hand Controller Equipment Manual," <i>JPL D-5172</i> , January 1988.
		MINSKY, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," <i>Ph.D. Dissertation</i> , MIT, June 1995, archived 7/6/95.
		JACOBSEN et al., "High Performance, Dextrous Telerobotic Manipulator With Force Reflection," <i>Intervention/ROV '91 Conference &amp; Exposition</i> , Hollywood, Florida, May 21-23, 1991.
		SHIMOGA, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," <i>Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration</i> , Rensselaer Polytechnic Institute, Sep. 30 - Oct. 1, 1992.
		IBM Technical Disclosure Bulletin, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990.
		TERRY et al., "Tactile Feedback In A Computer Mouse," <i>Proceedings of Fourteenth Annual Northeast Bioengineering Conference</i> , University of New Hampshire, March 10-11, 1988.
		HOWE, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," <i>Proceedings of the 1992 IEEE International Conference on Robotics and Automation</i> , Nice, France, May 1992.
		EBERHARDT et al., "OMAR - A Haptic display for speech perception by deaf and deaf-blind individuals," <i>IEEE Virtual Reality Annual International Symposium</i> , Seattle, WA, Sep. 18-22, 1993.
		RABINOWITZ et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contactor area," <i>Journal of The Acoustical Society of America</i> , Vol. 82, No. 4, October 1987.

Examiner  
SignatureDate  
Considered

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **5** of **6****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		BEJCZY et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," <i>International Computer Technology Conference, The American Society of Mechanical Engineers</i> , San Francisco, CA, August 12-15, 1980.
		BEJCZY et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," <i>SOAR '89 Workshop</i> , JSC, Houston, TX, July 25-27, 1989.
		OUIH-YOUNG, "A Low-Cost Force Feedback Joystick and Its Use in PC Video Games," <i>IEEE Transactions on Consumer Electronics</i> , Vol. 41, No. 3, August 1995.
		MARCUS, "Touch Feedback in Surgery," <i>Proceedings of Virtual Reality and Medicine The Cutting Edge</i> , Sept. 8-11, 1994.
		BEJCZY, et al., "Universal Computer Control System (UCCS) For Space Telerobots," CH2413-3/87/0000/0318501.00 1987 IEEE, 1987.
		PATRICK, "Design, Construction, and Testing of a Fingertip Tactile Display for Interaction with Virtual and Remote Environments," <i>Master of Science Thesis</i> , MIT, Aug. 1990, archived Nov. 8, 1990.
		CALDER, "Design of A Force-Feedback Touch-Introducing Actuator For Teleoperator Robot Control," <i>Bachelor of Science Thesis</i> , MIT, May 1983, archived June 23, 1983.
		WIKER, "Teletouch Display Development: Phase 1 Report," <i>Technical Report 1230</i> , Naval Ocean Systems Center, San Diego, July 1988.
		BLISS, "Optical-to-Tactile Image Conversion for the Blind," <i>IEEE Transactions on Man-Machine Systems</i> , Vol. MMS-11, No. 1, March 1970.
		JOHNSON, "Shape-Memory Alloy Tactile Feedback Actuator," <i>Armstrong Aerospace Medical Research Laboratory</i> , AAMRL-TR-90-039, August, 1990.
		KONTARINIS et al., "Tactile Display of Vibratory Information in Teleoperation and Virtual Environments," <i>PRESENCE</i> , 4(4):387-402, Harvard Univ., 1995.
		AUKSTAKALNIS et al., "Silicon Mirage: The Art and Science of Virtual Reality," ISBN 0-938151-82-7, pp. 129-180, 1992.
		EBERHARDT et al., "Inducing Dynamic Haptic Perception by The Hand: System Description and Some Results," DSC-Vol. 55-1, <i>Dynamic Systems and Control: Volume 1</i> , ASME 1994.
		GOBEL et al., "Tactile Feedback Applied to Computer Mice," <i>International Journal of Human-Computer Interaction</i> , Vol. 7, No. 1, pp. 1-24, 1995.
		PIMENTEL et al., "Virtual Reality: through the new looking glass," 2 <sup>nd</sup> Edition; McGraw-Hill, ISBN 0-07-050167-X, pp. 41-202, 1994.

Examiner  
SignatureDate  
Considered

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 6 of 6

**Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		"Cyberman Technical Specification," <i>Logitech Cyberman SWIFT Supplement to Logitech Mouse Technical Reference and Programming Guide</i> , 4/5/1994.
		OUHYOUNG et al., "The Development of A Low-Cost Force Feedback Joystick and Its Use in the Virtual Reality Environment," <i>Proceedings of the Third Pacific Conference on Computer Graphics and Applications, Pacific Graphics '95</i> , Seoul, Korea, 21-24 August 1995.
		KACZMAREK et al., "Tactile Displays," <i>Virtual Environment Technologies</i> , Chap. 9, pp. 349-414.
		LAKE, "Cyberman from Logitech," at <a href="http://www.ibiblio.org/GameBytes/issue21/greviews/cyberman.html">http://www.ibiblio.org/GameBytes/issue21/greviews/cyberman.html</a> , 1994.
		"Component Maintenance Manual With Illustrated Parts List, Coaxial Control Shaker Part No. C-25502," Safe Flight Instrument Corporation, Revised 28 January 2002 (3 pages).
		"Technical Manual Overhaul Instructions With Parts Breakdown, Coaxial Control Shaker Part No. C-25502," Safe Flight Instrument Corporation, Revised 15 July 1980 (23 pages).
		SCANNELL, "Taking a Joystick Ride," <i>Computer Currents</i> , Boston Edition, Vol. 9, No. 11, November 1994
		YAMAKITA et al., "Tele-Virtual Reality of Dynamic Mechanical Model," <i>Proceedings of the 1992 IEEE/RSJ International Conference on Intelligent Robots and Systems</i> , Raleigh, NC, July 7-10, 1992
		NOLL, "Man-Machine Tactile," <i>SID Journal</i> , July/August 1972 Issue.
		ROSENBERG, "Virtual Fixtures: Perceptual Overlays Enhance Operator Performance In Telepresence Tasks," <i>Ph.D. Dissertation</i> , Stanford University, June 1994.

Examiner  
SignatureDate  
Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 1 of 18

## Complete if Known

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

U.S. PATENT DOCUMENTS					
Examiner	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number Kind Code <sup>2</sup> (if known)			
		2,906,179	09/1959	Bower	
		3,157,853	11/17/1964	Hirsch	
		3,220,121	11/30/1965	Cutler	
		3,490,059	01/1970	Paulsen et al.	
		3,497,668	2/24/1970	Hirsch	
		3,517,446	06/30/1970	Corlyon et al.	
		3,531,868	10/1970	Stevenson	
		3,795,150	03/1974	Eckhardt	
		3,875,488	04/1975	Crocker et al.	
		3,890,958	06/1975	Fister et al.	
		3,902,687	6/25/1973	Hightower	
		3,903,614	09/09/1975	Diamond et al.	
		3,919,691	11/11/1975	Noll	
		3,923,166	12/02/1975	Fletcher et al.	
		3,944,798	03/1976	Eaton	
		4,114,882	09/1978	Mau	
		4,125,800	11/14/1978	Jones	
		4,131,033	12/1978	Wright et al.	
		4,148,014	04/1979	Burson	
		4,160,508	07/10/1979	Salsbury	
		4,216,467	08/1980	Colston	
		4,236,325	10/02/1980	Hall et al.	
		4,398,889	08/16/1983	Lam et al.	
		4,448,083	05/1984	Hayashi	
		4,477,043	10/1984	Repperger	
		4,477,973	10/1984	Davies	
		4,513,235	04/23/1985	Acklam et al.	
		4,550,221	10/1985	Mabusth	
		4,550,617	11/1985	Fraignier et al.	
		4,560,983	12/1985	Williams	
		4,571,834	02/1986	Fraser et al.	
		4,581,491	04/08/1986	Boothroyd	
		4,593,470	06/1986	Davies	
		4,599,070	07/08/1986	Hladky et al.	

Examiner  
Signature

Date  
Considered

<sup>1</sup> EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>2</sup> Applicant's unique citation designation number (optional). <sup>3</sup> Kind Codes of U.S. Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>4</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>5</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>6</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>7</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **2** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**U.S. PATENT DOCUMENTS**

Examiner	Cite No. <sup>1</sup>	Document Number Number Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		4,601,206	07/1986	Watson	
		4,603,284	07/29/1986	Perzley	
		4,604,016	08/1986	Joyce	
		4,632,341	07/1987	Repperger et al.	
		4,638,798	01/1987	Sheldon et al.	
		4,653,011	03/1987	Iwano	
		4,654,648	03/31/1987	Herrington et al.	
		4,676,002	06/1987	Slocum	
		4,679,331	12/1986	Koontz	
		4,688,983	08/1987	Lindborn	
		4,689,449	08/25/1987	Rosen	
		4,692,756	09/1987	Clark	
		4,703,443	10/1987	Moriyasu	
		4,704,909	11/1987	Grahn et al.	
		4,706,294	11/1987	Ouchida	
		4,708,656	11/24/1987	De Vries et al.	
		4,713,007	12/15/1987	Alban	
		4,734,685	03/1988	Watanabe	
		4,750,487	06/1988	Zanetti	
		4,769,763	09/1988	Trieb et al.	
		4,782,327	11/1988	Kley et al.	
		4,787,051	11/1988	Olson	
		4,791,934	12/1988	Brunnett	
		4,795,296	01/03/1989	Jau	
		4,798,919	01/1989	Miessler et al.	
		4,800,721	01/31/1989	Cemenska et al.	
		4,803,413	02/1989	Kendig et al.	
		4,811,608	03/1989	Hilton	
		4,819,195	04/1989	Bell et al.	
		4,823,634	04/25/1989	Culver	
		4,839,838	06/13/1989	LaBiche et al.	
		4,849,692	07/1989	Blood	
		4,853,874	08/01/1989	Iwamoto et al.	
		4,868,549	09/19/1989	Affinito et al.	

Examiner  
SignatureDate  
Considered

<sup>1</sup> EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>2</sup> Applicant's unique citation designation number (optional). <sup>3</sup> Kind Codes of U.S. Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>4</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>5</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>6</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>7</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **3** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**U.S. PATENT DOCUMENTS**

Examiner	Cite No. <sup>1</sup>	Document Number Number Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		4,879,556	11/1989	Duimel	
		4,888,538	12/19/1989	Dimitov et al.	
		4,888,877	12/1989	Enderle et al.	
		4,891,764	01/02/1990	McIntosh	
		4,891,889	01/1990	Tomelleri	
		4,896,554	01/1990	Culver	
		4,907,970	03/13/1990	Meenen, Jr.	
		4,907,973	03/1990	Hon	
		4,925,312	05/1990	Onaga et al.	
		4,930,770	06/05/1990	Baker	
		4,934,694	06/19/1990	McIntosh	
		4,935,728	06/19/1990	Kley	
		4,942,538	07/17/1990	Yuan et al.	
		4,942,545	07/1990	Sapia	
		4,945,305	07/1990	Blood	
		4,945,501	07/1990	Bell et al.	
		4,949,119	08/14/1990	Moncrief et al.	
		4,961,038	10/1990	MacMinn	
		4,961,138	10/1990	Gorniak	
		4,961,267	10/1990	Herzog	
		4,962,448	10/1990	DeMaio et al.	
		4,962,591	10/1990	Zeller et al.	
		4,982,504	01/1991	Soderberg et al.	
		4,982,618	01/1991	Culver	
		4,983,786	01/1991	Stevens et al.	
		4,983,901	01/1991	Lehmer	
		5,007,085	04/09/1991	Greanias et al.	
		5,007,300	04/16/1991	Siva	
		5,018,922	05/28/1991	Yoshinada et al.	
		5,019,761	05/28/1991	Kraft	
		5,022,407	06/11/1991	Horch et al.	
		5,035,242	07/30/1991	Franklin	
		5,038,089	08/06/1991	Szakaly	
		5,040,306	08/1991	McMurtry et al.	
		5,044,956	09/03/1991	Behensky et al.	
Examiner Signature			Date Considered		

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Kind Codes of U.S. Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **4** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

U.S. PATENT DOCUMENTS					
Examiner	Cite No. <sup>1</sup>	Document Number Number Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		5,050,608	09/29/1991	Watanabe et al.	
		5,065,145	11/1991	Purcell	
		5,072,361	12/10/1991	Davis et al.	
		5,076,517	12/1991	Ferranti et al.	
		5,078,152	010/7/1992	Bond	
		5,080,377	01/14/1992	Stamper et al.	
		5,088,046	02/1992	McMurtry et al.	
		5,088,055	02/1992	Oyama	
		5,095,303	03/1992	Clark et al.	
		5,103,404	04/07/1992	McIntosh	
		5,107,080	04/21/1992	Rosen	
		5,107,262	04/1992	Cadoz et al.	
		5,116,051	05/26/1992	Moncrief et al.	
		5,116,180	05/1992	Fung et al.	
		5,126,948	06/1992	Mitchell et al.	
		5,128,671	07/07/1992	Thomas Jr.	
		5,131,844	07/1992	Marinaccio et al.	
		5,132,672	07/21/1992	Clark	
		5,139,261	08/18/1992	Openiano	
		5,142,506	08/1992	Edwards	
		5,142,931	09/01/1992	Menahem	
		5,143,505	09/01/1992	Burdea et al.	
		5,146,566	09/08/1992	Hollis, Jr. et al.	
		5,148,377	09/1992	McDonald	
		5,178,012	01/1993	Culp	
		5,181,181	01/19/1993	Glynn	
		5,182,557	01/1993	Lang	
		5,184,306	02/1993	Edrman et al.	
		5,184,319	02/02/1993	Kramer	
		5,185,561	02/09/1993	Good et al.	
		5,186,629	02/1993	Rohen	
		5,186,695	02/16/1993	Mangseth et al.	
		5,187,874	02/1993	Takahashi et al.	
		5,189,355	02/1993	Larkins et al.	

Examiner  
SignatureDate  
Considered

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Kind Codes of U.S. Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **5** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**U.S. PATENT DOCUMENTS**

Examiner	Cite No. <sup>1</sup>	Document Number Number Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		5,189,806	03/1993	McMurtry et al.	
		5,193,963	03/16/1993	McAfee et al.	
		5,195,179	03/1993	Tokunaga	
		5,197,003	03/1993	Moncrief et al.	
		5,203,563	04/1993	Loper, III	
		5,204,824	04/1993	Fujimaki	
		5,209,131	05/1993	Baxter	
		5,212,473	5/18/1993	Louis	
		5,220,260	06/15/1993	Schuler	
		5,223,776	06/29/1993	Radke et al.	
		5,228,356	07/1993	Chuang	
		5,230,623	07/27/1993	Guthrie et al.	
		5,235,868	08/17/1993	Culver	
		5,235,868	08/1993	Culver	
		5,240,417	8/31/1993	Smithson et al.	
		5,243,266	09/07/1993	Kasagami et al.	
		5,251,127	10/1993	Raab	
		5,251,156	10/1993	Heier et al.	
		5,259,120	11/1993	Chapman et al.	
		5,259,894	11/1993	Sampson	
		5,262,777	11/1993	Low et al.	
		5,264,768	11/23/1993	Gregory et al.	
		5,266,875	11/30/1993	Slotine et al.	
		5,271,290	12/21/1993	Fischer	
		5,275,174	01/04/1994	Cook	
		5,275,565	01/04/1994	Moncrief	
		5,286,203	02/1994	Fuller, et al.	
		5,289,273	02/22/1994	Lang	
		5,296,846	03/1994	Ledley	
		5,296,871	03/1994	Paley	
		5,298,890	03/1994	Kanamaru et al.	
		5,299,810	04/05/1994	Pierce	
		5,309,140	05/03/1994	Everett	
		5,313,230	05/1994	Venolia et al.	

Examiner  
SignatureDate  
Considered

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Kind Codes of U.S. Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **6** of **18****Complete if Known**Application Number **10/615,927**Filing Date **July 10, 2003**First Named Inventor **Louis B. Rosenberg**Art Unit **2675**Examiner Name **Unassigned**Attorney Docket Number **IMMR106/01US****U.S. PATENT DOCUMENTS**

Examiner	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number Kind Code <sup>2</sup> (if known)			
		5,334,027	08/02/1994	Wherlock	
		5,341,459	08/23/1994	Backes	
		5,351,692	10/1994	Dow et al.	
		5,354,162	10/11/1994	Burdea et al.	
		5,355,148	10/1994	Anderson	
		5,374,942	12/1994	Gilligan et al.	
		5,379,663	01/1995	Hara	
		5,381,080	01/1995	Schnell et al.	
		5,384,460	01/1995	Tseng	
		5,386,507	01/1995	Teig et al.	
		5,389,865	02/14/1995	Jacobus et al.	
		5,396,266	03/07/1995	Brimhall	
		5,396,267	03/07/1995	Bouton	
		5,397,323	03/1995	Taylor et al.	
		5,402,582	04/1995	Raab	
		5,405,152	04/11/1995	Katanics et al.	
		5,412,880	05/1995	Raab	
		5,414,337	05/09/1995	Schuler	
		5,417,696	05/1995	Kashuba et al.	
		5,428,748	06/27/1995	Davidson et al.	
		5,429,140	07/04/1995	Burdea et al.	
		5,435,554	07/25/1995	Lipson	
		5,436,542	07/25/1995	Petelin et al.	
		5,436,638	07/25/1995	Bolas et al.	
		5,436,640	07/1995	Reeves	
		5,445,166	08/1995	Taylor	
		5,451,924	09/19/1995	Massimino et al.	
		5,459,382	10/17/1995	Jacobus et al.	
		5,466,213	11/14/1995	Hogan	
		5,467,763	11/1995	McMahon et al.	
		5,471,571	11/1995	Smith et al.	
		5,482,051	01/1996	Reddy et al.	
		5,512,919	04/30/1996	Araki	
		5,513,100	04/30/1996	Parker et al.	

Examiner  
SignatureDate  
Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Kind Codes of U.S. Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **7** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

U.S. PATENT DOCUMENTS					
Examiner	Cite No. <sup>1</sup>	Document Number Number Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		5,526,480	06/1996	Gibson	
		5,530,455	06/1996	Gillick et al.	
		5,547,382	08/20/1996	Yamasaki	
		5,550,562	08/27/1996	Aoki et al.	
		5,551,701	09/03/1996	Bouton et al.	
		5,565,840	10/1996	Thorner et al.	
		5,565,887	10/1996	McCambridge et al.	
		5,565,888	10/1996	Selker	
		5,570,111	10/1996	Barrett et al.	
		5,576,727	11/19/1996	Rosenberg et al.	
		5,577,981	11/26/1996	Jarvik	
		5,583,407	12/1996	Yamaguchi	
		5,583,478	12/1996	Renzi	
		5,586,257	12/17/1996	Perlman	
		5,587,937	12/24/1996	Massie et al.	
		5,589,828	12/31/1996	Armstrong	
		5,589,854	12/31/1996	Tsai	
		5,591,924	01/1997	Hilton	
		5,596,347	01/1997	Robertson et al.	
		5,619,180	04/1997	Massimino et al.	
		5,623,582	04/22/1997	Rosenberg	
		5,623,642	04/22/1997	Katz et al.	
		5,625,576	04/29/1997	Massie et al.	
		5,629,594	05/1997	Jacobus et al.	
		5,629,597	05/1997	Jacobus, et al.	
		5,631,861	05/1997	Kramer	
		5,642,469	06/24/1997	Hannaford et al.	
		5,643,087	07/01/1997	Marcus et al.	
		5,656,901	08/1997	Kurita	
		5,666,138	09/09/1997	Culver	
		5,666,473	09/09/1997	Wallace	
		5,690,582	11/25/1997	Ulrich et al.	
		5,691,747	11/1997	Amano	
		5,691,898	11/25/1997	Rosenberg et al.	

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Kind Codes of U.S. Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet 8 of 18

**Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**U.S. PATENT DOCUMENTS**

Examiner	Cite No. <sup>1</sup>	Document Number Number Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		5,694,013	12/02/1997	Stewart et al.	
		5,701,140	12/1997	Rosenberg et al.	
		5,709,219	01/20/1998	Chen et al.	
		5,714,978	02/03/1998	Yamanaka et al.	
		5,721,566	02/24/1998	Rosenberg et al.	
		5,724,068	03/1998	Sanchez et al.	
		5,731,804	03/1998	Rosenberg	
		5,734,373	03/31/1998	Rosenberg et al.	
		5,736,978	04/07/1998	Hasser et al.	
		5,739,811	04/1998	Rosenberg et al.	
		5,742,278	04/21/1998	Chen et al.	
		5,745,715	04/1998	Pickover et al.	
		5,754,023	05/19/1998	Roston et al.	
		5,755,577	05/26/1998	Gillio	
		5,757,358	05/1998	Osga	
		5,760,764	06/1998	Martinelli	
		5,766,016	6/16/1998	Sinclair	
		5,767,839	06/16/1998	Rosenberg	
		5,769,640	06/23/1998	Jacobus et al.	
		5,771,037	06/23/1998	Jackson	
		5,781,172	07/14/1998	Engel et al.	
		5,784,052	07/1998	Keyson	
		5,785,630	07/28/1998	Bobick et al.	
		5,786,818	07/1998	Brewer et al.	
		5,790,108	08/04/1998	Salcudean et al.	
		5,791,992	08/11/1998	Crump et al.	
		5,802,353	09/01/1998	Avila et al.	
		5,805,140	09/08/1998	Rosenberg et al.	
		5,805,165	09/1998	Thorne, III et al.	
		5,808,601	09/1998	Leah et al.	
		5,818,423	10/1998	Pugliese et al.	
		5,825,308	10/1998	Rosenberg	
		5,831,408	11/03/1998	Jacobus et al.	
		5,844,392	12/01/1998	Peurach et al.	

Examiner  
SignatureDate  
Considered

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Kind Codes of U.S. Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **9** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**U.S. PATENT DOCUMENTS**

Examiner	Cite No. <sup>1</sup>	Document Number Number Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		5,877,748	03/1999	Redlich	
		5,880,714	03/1999	Rosenberg et al.	
		5,884,029	03/16/1999	Brush, II et al.	
		5,889,670	03/30/1999	Schuler et al.	
		5,889,672	03/1999	Schuler et al.	
		5,956,484	09/21/1999	Rosenberg et al.	
		5,990,869	11/23/1999	Kubica et al.	
		6,004,134	12/21/1999	Marcus et al.	
		6,020,876	02/2000	Rosenberg et al.	
		6,028,593	02/2000	Rosenberg et al.	
		6,057,828	05/2000	Rosenberg et al.	
		6,061,004	05/2000	Rosenberg	
		6,078,308	06/2000	Rosenberg et al.	
		6,088,017	07/11/2000	Tremblay et al.	
		6,088,019	07/2000	Rosenberg	
		6,101,530	08/08/2000	Rosenberg et al.	
		6,111,577	08/29/2000	Zilles et al.	
		6,125,385	09/26/2000	Wies et al.	
		6,131,097	10/10/2000	Peurach et al.	
		6,161,126	12/12/2000	Wies et al.	
		6,162,123	12/2000	Woolston	
		6,422,941	07/23/2002	Thorner et al.	

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			
		WO	WO9520788		08/03/1995		
		WO	WO9502801		01/26/1995		
		UK	2254911A		10/21/1992		
		WO	WO9622591		07/25/1996		
		WO	WO9616397		05/30/1996		
		EP	0085518 A1		08/10/1983		
		WO	WO9642078		12/27/1996		
		WO	WO9532459		11/30/1995		
		WO	WO9712337		04/03/1997		

Examiner  
SignatureDate  
Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Kind Codes of U.S. Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet 10 of 18

**Complete if Known**

Application Number 10/615,927

Filing Date July 10, 2003

First Named Inventor Louis B. Rosenberg

Art Unit 2675

Examiner Name Unassigned

Attorney Docket Number IMMR106/01US

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			
		WO	WO9712357		04/03/1997		
		WO	WO9719440		05/25/1997		
		WO	WO9731333		08/28/1997		
		WO	WO9721160		06/12/1997		
		EP	0265011	A1	04/1988		
		EP	0607580	A1	07/1994		
		EP	0626634		05/1994		
		WO	WO9520787		08/1995		
		WO	WO9502233		01/1995		
		WO	WO9510080		04/1995		
		Japan	4-34610		02/1992		
		EP	EP0349086		01/03/1990		

Examiner  
SignatureDate  
Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Kind Codes of U.S. Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 11 of 18

## Complete if Known

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

## OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		"Foot-Operated Mouse," IBM Technical Disclosure Bulletin, Apr. 1986, vol. 28, No. 11.
		"High Performance Model of the Immersion Probe," Immersion-Probe-MD™, Immersion Human Interface Corporation.
		"Proceedings of the IFIP Congress 65," International Federation for Information Processing, Information Processing 1965, vol. 3, New York, May 24-29, pp. 506.
		"The Personal Digitizer™," Immersion Human Interface Corporation 1994.
		"Useful Technology for Your Idea File," Design News, Mar. 7 1994, pp. 63.
		3D Human Interface Tool, Immersion Probe™, Immersion Human Interface Corporation 1994.
		SLOCUM, Precision Machine Design, , Prentice Hall, pp. 661, 664.
		Cursor Walso, "Designer's Corner-Useful Technology for Your Idea File." Design News, Mar. 7, 1993, p. 63
		IBM Technical Disclosure Bulletin, "Mouse Ball-Actuating Device With Force and Tactile Feedback," Vol. 32, No. 9B, February 1990.
		ADACHI, YOSHITAKA et al., "Sensory Evaluation of Virtual Push-Buttons," Technical Research Center, Suzuki Motor Corporation, November 1994.
		ADELSTEIN, "A Virtual Environment System For The Study of Human Arm Tremor," Ph.D. Dissertation, Dept. of Mechanical Engineering, MIT, June 1989.
		ADELSTEIN, BERNARD D. et al., "A High Performance Two Degree-of-Freedom Kinesthetic Interface," Massachusetts Institute of Technology 1992, pp. 108-112.
		ADLESTEIN, BERNARD D. et al, "Design and Implementation of a Force Reflecting Manipulandum for Manual Control Research," 1992, pp. 1-24.
		AKAMATSU, M. et al., "Multimodal Mouse: A Mouse-Type Device with Tactile and Force Display," Presence, Vol. 3, No. 1, Winter 1994, pp. 73-80.
		ALBERS, F. GERRY, "Microcomputer Base for Control Loading," Naval Training Equipment Center 11 <sup>th</sup> NTEC-Industry Conference Proceedings, NAVTRAEEQUIPCENT IH-306, 1978.

Examiner  
SignatureDate  
Considered

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

# **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet 12 of 18

**Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

## **OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		ANSLEY, D., "Thimble gets in touch with reality," New Scientist, 1994, p.19.
		ATKINSON, WILLIAM D. et al., "Computing with Feeling," Comput. & Graphics, vol. 2, No. 2-E, pp. 97-103.
		BAIGRIE, "Electric Control Loading – A Low Cost, High Performance Alternative," Proceedings, pp. 247-254, November 6-8, 1990.
		BATTER, JAMES J. et al., "Grove-1: A Computer Display to the Sense of Feel," pp. TA-4-188-TA-4-192.
		BEJCZY, ANTAL K., "The Phantom Robot: Predictive Displays for Teleoperation with Time Delay," IEEE 1990, pp. 546-550.
		BEJCZY, "Sensors, Controls, and Man-Machine Interface for Advanced Teleoperation," Science, Vol. 208, No. 4450, pp. 1327-1335, 1980.
		BEJCZY, "Generalization of Bilateral Force-Reflecting Control of Manipulators," Proceedings of Fourth CISM-IFTOMM, Sep. 8-12, 1981.
		BEJCZY et al., "Kinesthetic Coupling Between Operator and Remote Manipulator," International Computer Technology Conference, The American Society of Mechanical Engineers, San Francisco, CA, August 12-15, 1980.
		BEJCZY et al., "A Laboratory Breadboard System For Dual-Arm Teleoperation," SOAR '89 Workshop, JSC, Houston, TX, July 25-27, 1989.
		BEJCZY, et al., "Tele-Virtual Reality of Dynamic Mechanical Model," Proceedings of the 1992 IEEE/RSJ International Conference on Intelligent Robots and Systems, Raleigh, NC, July 7-10, 1992.
		BROOKS, JR., F., et al., "Project GROPE-Haptic Displays for Scientific Visualization," Computer Graphics, vol. 24, Number 4, Aug., 1990, pp. 177-185.
		BROOKS et al., "Hand Controllers for Teleoperation – A State-of-the-Art Technology Survey and Evaluation," JPL Publication 85-11; NASA-CR-175890; N85-28559, pp. 1-84, 03/1/1985.
		BURDEA, GRIGORE et al., "A Portable Dextrous Master with Force Feedback," Presence: Teleoperators and Virtual Environments, MIT Press, June 1991.
		BURDEA, GRIGORE et al., "Distributed Virtual Force Feedback, Lecture Notes for Workshop on Force Display in Virtual Environments and its Application to Robotic Teleoperation," 1993 IEEE International Conference on Robotics and Automation, May 2, 1993, pp. 25-44.
		BURDEA, GRIGORE, et al., "Dextrous Telerobotics with Force Feedback-An Overview," Robotica 1991, Vol. 9.

Examiner  
SignatureDate  
Considered

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **13** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		BUTTOLO, PIETRO et al., "Pen-Based Force Display for Precision Manipulation in Virtual Environments," IEEE March 1995, pp. 1-8.
		CALDWELL, et al., "Enhanced Tactile Feedback (Tele-Taction) Using a Multi-Functional Sensory System," 1050-4729/93, pp. 955-960, 1993.
		COLGATE, J. EDWARD et al., "Implementation of Stiff Virtual Walls in Force-Reflecting Interfaces," September 22, 1993, pp. 1-9..
		EBERHARDT et al., "OMAR – A Haptic display for speech perception by deaf and deaf-blind individuals," IEEE Virtual Reality Annual International Symposium, Seattle, WA, Sep. 18-22, 1993.
		ELLIS, R.E. et al., "Design and Evaluation of a High-Performance Prototype Planar Haptic Interface," ASME December 3, 1993, DSC-Vol. 49, pp. 55-64.
		FISCHER, PATRICK et al., "Specification and Design of Input Devices for Teleoperation," 1990.
		FISHER, S.S. et al., "Virtual Environment Display System," ACM Interactive 3D Graphics, October, 1986.
		GOSSWEILER et al., "An Introduced Tutorial for Developing Multi-User Virtual Environments," Presence: Teleoperators and Virtual Environments, MIT Press, 3(4), Fall 94 pp. 255-264.
		GOTOW, J.K., et al., "Perception of Mechanical Properties at the Man-Machine Interface," IEEE 1987, pp. 688-689.
		GOTOW et al., "Controlled Impedance Test Apparatus for Studying Human Interpretation of Kinesthetic Feedback," WA11-11:00, pp. 332-337.
		HANNAFORD, B. et al., "Force Feedback Cursor Control," NASA Tech Brief, Vol. 13, No. 11, Item #21, 1989, pp. 1-4.
		HANNAFORD, BLAKE et al., "Performance Evaluation of a Six-Axis Generalized Force-Reflecting Teleoperator," IEEE May/June 1991, Vol. 21, No. 3, pp. 620-633.
		HASSER, CHRISTOPHER JOHN, "Tactile Feedback for a Force-Reflecting Haptic Display," The School of Engineering, University of Dayton, December 1995, pp. iii-xii & 1-96.
		HERNDON, J.N. et al., "The State-of-the-Art Model M-2 Maintenance System," Proc. of the 1984 Natl Meeting on Robotics and Remote Handling in Hostile Environments, American Nuclear Society, 1984, pp. 59-65.
		HIROTA, K., et al., "Development of Surface Display," IEEE 0-7803-1363-1, 1993, pp. 256-262.

Examiner  
SignatureDate  
Considered

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO		<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)		Application Number	10/615,927
		Filing Date	July 10, 2003
		First Named Inventor	Louis B. Rosenberg
		Art Unit	2675
		Examiner Name	Unassigned
Sheet 14 of 18	Attorney Docket Number	IMMR106/01US	

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
		HOWE, ROBERT D., "Task Performance with a Dextrous Teleoperated Hand System," Proceedings of SPIE, November 1992, Vol. 1833, pp. 1-9.	
		HOWE, "A Force-Reflecting Teleoperated Hand System for the Study of Tactile Sensing in Precision Manipulation," Proceedings of the 1992 IEEE International Conference on Robotics and Automation, Nice, France, May 1992.	
		IWATA, HIROO et al., "Volume Haptization," IEEE 1993, pp. 16-18.	
		IWATA, HIROO, "Artificial Reality with Force-Feedback: Development of Desktop Virtual Space with Compact Master Manipulator," Computer Graphics, Vol. 24, No. 4, 1990, pp. 165-170.	
		IWATA, HIROO, "Pen-based Haptic Virtual Environment," Institute of Engineering Mechanics, University of Tsukuba, Japan, pp. 287-292.	
		JACOBSEN, S.C. et al., "High Performance, High Dexterity, Force Reflective Teleoperator II," ANS Topical Meeting on Robotics & Remote Systems, Albuquerque, New Mexico February 24-27, 1991, pp. 1-10.	
		JONES, L.A., et al., "A Perceptual Analysis of Stiffness," Experimental Brain Research, Vol. 79, No. 1, pp. 150-156, 1990.	
		KELLEY, A. J. et al., "MagicMouse: Tactile and Kinesthetic Feedback in the Human-Computer Interface using an Electromagnetically Actuated Input/Output Device," Dept. of Elec. Eng., Univ. of Brit. Columbia, 1993, pp. 1-27.	
		KELLEY, A. J. et al., "On the Development of a Force-Feedback Mouse and Its Integration into a Graphical User Interface," Symp. On Haptic Interfaces for Virtual Environment and Teleoperator Systems, 1994 Int'l Mechanical Engineering Congress and Exhibition, Chicago, IL., Nov. 1994, pp. 1-8.	
		KILPATRICK, P., "The use of a Kinesthetic Supplement in an Interactive Graphics System," University of North Carolina, 1976, pp. 1-175.	
		KIM, WON S. et al., "A Teleoperation Training Simulator with Visual and Kinesthetic Force Virtual Reality."	
		KIM, WON S. et al., "Graphics Displays for Operator Aid in Telemanipulation," IEEE 1991, pp. 1059-1067.	
		KONTARINIS et al., "Display of High-Frequency Tactile Information to Teleoperators," Telemanipulator Technology and Space Telerobotics, Won S. Kim, Editor, Proc. SPIE Vol. 2057, pp. 40-50, Sep. 7-9, 1993.	
		KOTOKU, TETSUO et al., "Environment Modeling for the Interactive Display (EMID) Used in Telerobotic Systems," IEEE November 3-5, 1991, pp. 99-1004.	
		KOTOKU, TETSUO, "A Predictive Display with Force Feedback and its Application to Remote Manipulation System with Transmission Time Delay," IEEE 1992, 1992, pp. 239-246.	
Examiner Signature		Date Considered	

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

# **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet 15 of 18

**Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

## **OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		KRISHNA ROY, "Virtual Presence Takes Surgeons through the Virtual Keyhole to Hone Their Skills", Business & Industry, Jul. 4, 1995.
		KRUEGER, MYRON W., Artificial Reality 1988, pp. 54-75.
		McAFFEE, DOUGLAS A., "Teleoperator System/Telerobot Demonstrator: Force Reflecting Hand Controller Equipment Manual," JPL D-5172, pp. 1-50, A1-A36, B1-B5, C1-C36, January 1988.
		MARCUS, "Touch Feedback in Surgery," Proceedings of Virtual Reality and Medicine The Cutting Edge, Sep. 8-11, 1994.
		MEYER, KENNETH et al., "A Survey of Position Trackers," The Massachusetts Institute of Technology 1992, Presence, vol. 1, No. 2.
		MILLMAN, P. et al., "Design of a Four-Degree-of-Freedom Force-Reflecting Manipulandum with a Specified Force/Torque Workspace," IEEE CH2969-4, 1991, pp. 1488-1493.
		MINSKY, MARGARET et al., "Feeling and Seeing: Issues in Force Display," ACM 1990, pp. 235-242.
		MINSKY, "Computational Haptics: The Sandpaper System for Synthesizing Texture for a Force-Feedback Display," Ph.D. Dissertation, MIT, June 1995.
		MUNCH, S. et al., "Intelligent Control for Haptic Displays," Eurographics '96, Vol. 15, No. 3, Eurographics Association, 1996, pp. C217-C226.
		NOLL, A. MICHAEL, "Man-Machine Tactile Communication Dissertation," Polytechnic Institute of Brooklyn, June 1971, pp. 1-88.
		NOLL, "Man-Machine Tactile," SID Journal, July/August 1972 Issue.
		OUH-YOUNG, MING et al., "Creating an Illusion of Feel: Control Issues in Force Display," University of North Carolina, 1989, pp. 1-14.
		OUH-YOUNG, MING et al., "Force Display Performs Better than Visual Display in a Simple 6-D Docking Task," IEEE 1989, pp. 1462-1466.
		OUH-YOUNG, MING et al., "Using a Manipulator for Force Display in Molecular Docking," IEEE 1988, pp. 1824-1829.
		OUH-YOUNG, MING, "Force Display in Molecular Docking," Chapel Hill 1990, p. 1-369.

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet 16 of 18

**Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
		OUH-YOUNG, "A Low-Cost Force Feedback Joystick and Its Use in PC Video Games," IEEE Transactions on Consumer Electronics, Vol. 41, No. 3, August 1995.	
		PATRICK et al., "Design and Testing of a Non-reactive, Fingertip, Tactile Display for Interaction with Remote Environments," Cooperative Intelligent Robotics in Space, Rui J. deFigueiredo et al., Editor, Proc. SPIE Vol. 1387, pp. 215-222, 1990.	
		PAYETTE, J. et al., "Evaluation of a Force Feedback (Haptic) Computer Pointing Device in Zero Gravity," DSC-Vol. 58, Proc. of ASME Dynamics Systems, ASME 1996, pp. 547-553.	
		RABINOWITZ et al., "Multidimensional tactile displays: Identification of vibratory intensity, frequency, and contactor area," Journal of The Acoustical Society of America, Vol. 82, No. 4, October 1987.	
		RAMSTEIN et al., "The Pantograph: A large Workspace Haptic Device for a Multimodal Human-Computer Interaction," Computer-Human Interaction, CHI '94, pp. 1-3.	
		RAMSTEIN, C., "Combining Haptic and Braille Technologies: Design Issues and Pilot Study," ASSETS '96, ACM 0-89791-776-6, 1996, pp. 37-44.	
		REPPERGER, D.W., "Active Force Reflection Devices in Teleoperation," IEEE Control Systems.	
		ROSENBERG, LOUIS, Ph.D., "Using Force Feedback to Enhance Human performance in Graphical User Interfaces," Apr. 1996.	
		ROSENBERG et al., "Commercially Viable Force Feedback Controller for Individuals with Neuromotor Disabilities," Crew Systems Directorate, AL/CF-TR-1997-0016, 1996, pp. 1-33.	
		ROSENBERG et al., "The use of force feedback to enhance graphical user interfaces," Stereoscopic Displays and Virtual Reality Systems III, 1996, pp. 243-248.	
		ROSENBERG, L., "Virtual Fixtures: Perceptual Overlays Enhance Operator Performance in Telepresence Tasks", Stanford University, Jun. 1994, pp. 1-214.	
		ROSENBERG, LOUIS B. et al. "Perceptual Decomposition of Virtual Haptic Surfaces," IEEE, October 1993.	
		ROSENBERG, LOUIS B., "Perceptual Design of a Virtual Rigid Surface Contact," Center for Design Research Stanford University, Air Force Material Command, April 1993, pp. 1-41.	
		ROSENBERG, LOUIS B., "The Use of Virtual Fixtures as Perceptual Overlays to Enhance Operator Performance in Remote Environments," Air Force Material Command, September 1992, pp. 1-42.	
		ROSENBERG, LOUIS B., "The Use of Virtual Fixtures to Enhance Operator Performance in Time Delayed Teleoperation," Armstrong Laboratory, March 1993, pp. 1-45.	
Examiner Signature		Date Considered	

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet **17** of **18****Complete if Known**

Application Number	10/615,927
Filing Date	July 10, 2003
First Named Inventor	Louis B. Rosenberg
Art Unit	2675
Examiner Name	Unassigned
Attorney Docket Number	IMMR106/01US

**OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		ROSENBERG, LOUIS B., "Virtual Fixtures as Tools to Enhance Operator Performance in Telepresence Environments," SPIE Telemanipulator Technology, 1993.
		ROSENBERG, LOUIS B., "Virtual Haptic Overlays Enhance Performance in Telepresence Tasks," SPIE, 1994.
		ROSENBERG, LOUIS B., "Crew Systems Directorate Biodynamics and Biocommunications Division Wright-Patterson, Air Force Material Command, Mar. 1993, pp. 1-45.
		RUSO, MASSIMO ANDREA, "The Design and Implementation of a Three Degree-of-Freedom Force Output Joystick," Department of Mechanical Engineering, May 11, 1990, pp. 9-40 & 96 & 97.
		RUSO, "Controlling Dissipative Magnetic Particle Brakes in Force Reflective Devices," DSC-Vol. 42, Advances in Robotics, pp. 63-70, ASME 1992.
		SCHMILT, BRIAN et al., "Application Areas for a Force-Feedback Joystick," ASME 1993, DSC-Vol. 49, pp. 47-54.
		SHIMOGA, "Finger Force and Touch Feedback Issues in Dexterous Telemanipulation," Proceedings of Fourth Annual Conference on Intelligent Robotic Systems for Space Exploration, Rensselaer Polytechnic Institute, Sep. 30 – Oct. 1, 1992.
		SMITH, GEOFFREY, "Call It Palpable Progress," Business Week, Oct. 9, 1995, p. 93, 96.
		SNOW, et al., "Model-X Force-Reflecting-Hand-Controller," NT Control No. MPO-17851; JPL Case No. 5348, pp. 1-4, 06/15/1989.
		SNOW, E. et al., "Compact Force-Reflecting Hand Controller," JPL, Apr. 1991, vol. 15, No. 3, Item No. 153, pp. 1-15a.
		STANLEY et al., "Computer Simulation of Interacting Dynamic Mechanical Systems Using Distributed Memory Parallel Processors," DSC-Vol. 42, Advances in Robotics, pp. 55-61, ASME 1992.
		SU, S. AUGUSTINE et al., "The Virtual Panel Architecture: A 3D Gesture Framework," IEEE 1993, pp. 387-393.
		TADROS, "Control System Design for a Three Degree of Freedom Virtual Environment Simulator Using Motor/Brake Pair Actuators, MIT Archive, pp. 1-88, February 1990.
		TAN, HONG Z et al., "Manual Resolution of Compliance When Work and Force Cues are Minimized," ASME 1993, DSC-vol. 49, pp. 99-104.
		TAN, HONG Z. et al., "Human Factors for the Design of Force-Reflecting Haptic Interfaces," Tan, Srinivasan, Eberman, & Chang, ASME WAM 1994, pp. 1-11.

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

# **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet 18 of 18

**Complete if Known**

Application Number 10/615,927

Filing Date July 10, 2003

First Named Inventor Louis B. Rosenberg

Art Unit 2675

Examiner Name Unassigned

Attorney Docket Number IMMR106/01US

**OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
		TAVKHELIDZE, D.S. "Kinematic Analysis of Five-Link Spherical Mechanisms, Mechanism and Machine Theory 1974, vol. 9, pp. 181-190.	
		TERRY et al., "Tactile Feedback In A Computer Mouse," Proceedings of Fourteenth Annual Northeast Bioengineering Conference, University of New Hampshire, March 10-11, 1988.	
		WIKER, S. et al., "Development of Tactile Mice for Blind Access to Computers: Importance of Stimulation Locus, Object Size, and Vibrotactile Display Resolution," Proc. of the Human Factors Society 35 <sup>th</sup> Annual Meeting 1991, , pp. 708-712.	
		WINEY III, C.ALVIN McCOY, "Computer Simulated Visual and Tactile Feedback as an Aid to Manipulator and Vehicle Control," Mstr of Science in Mechanical Engineering, MIT Jun. 1981, pp. 1-80.	
		YAMAKITA, M. et al., "Tele-Virtual Reality of Dynamic Mechanical Model, Proceedings of the 1992 IEEE/RSJ International Conference on Intelligent Robots and Systems, Raleigh, NC, July 7-10, 1992, pp. 1103-1110.	
		YOKOKOHJI et al., "What You Can See is What You Can Feel - Development of a Visual/Haptic Interface to Virtual Environment," Proceedings of VRAIS '96, IEEE 1996, pp. 46-54.	

Examiner  
SignatureDate  
Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.